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Destination Competitiveness and Sustainable Tourism: A Critical Review

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Abstract

Tourism Attraction can increase the sources of revenue and subsequently improve a destination's performance, but the statistical significance of the potential attractors need additional research and Tourism discipline can offer the necessary tools for these strategic decisions. To this end and in contrast with monitoring reports based on descriptive methods, in this paper we use the two-stage Data Envelopment Analysis (DEA) to analyze the performance of Spanish tourism regions for the period 2008-2011. We apply the Simar and Wilson (2007, 2011) double bootstrap procedure in order to investigate to what extent the efficiency of a destination is determined by a group of contextual variables. This two-stage procedure has supposed a turning point in the methodology and there are only a handful of very recent studies of this type in the literature on destination competitiveness. Policy makers should act in consequence with the results derived from the proposed methodology. Spain is the first country in the 2015 WEF competitiveness index and following UNWTO recommendations, it is essential to move towards responsible tourism in all aspects. We address some final considerations about the link between competitiveness and sustainability of the Spanish touristic model.

Keywords: data envelopment analysis; destination competitiveness, efficiency determinants; tourism attraction, sustainable tourism

1. Introduction

The main challenge for those countries seeking to maintain destination competitiveness is to design information systems that can address the key question: How can a tourist destination maintain, control and enhance its position in a global environment marked by non-stop competition growth? When many countries are suffering from high unemployment, the development of the Travel & Tourism (T&T) sector is all the more important news today, especially, given its significant role in job creation. According to World Travel and Tourism Council (WTTC) economic impact report, T&T contribution to world Gross Domestic Product (GDP) grew for the fifth consecutive year in 2014, helped especially by strong demand from international travelers. Visitor exports, the measure of money spent by these international tourists, rose by 3.9% at a global level year on year, to $1,3trillion, and by over 10% within South East Asia. In 2014, total contribution to the global economy rose to 9.5% of global GDP (US $7 trillion), growing faster than other significant sectors such as financial and business services, transport and manufacturing. In total, nearly 266 million jobs were supported by T&T in 2013, it means 1 in 11 of all jobs in the world (9.1%), and 1 in 10 of all jobs in the world is expected by 2020 with 50% of such employment being direct and 50% indirect.

The sustained demand for Travel and Tourism, with its ability to generate employment continues to prove the importance of the sector as a tool for economic development and job creation. The sector in 2014 is also very positive, with GDP growth of 4.3%. Much of this growth is being driven by higher consumer spending as the recovery from recession is becoming firmly established. Tourists are expected to spend more per trip and stay longer on their holidays in 2015. Forecasts over the next ten years also look extremely favorable, with predicted growth rates of over 4% annually that continue to be higher than growth rates in other sectors. Opportunities will require authorities, particularly those in emerging markets, to create favourable business climates for investment in the infrastructure and human resource support necessary to facilitate a successful and sustainable tourism sector. Governments can also do much to implement more open VISA regimes and to employ intelligent rather than punitive taxation policies.

Growth in T&T demand from emerging markets continues with pace, as large rising middle-classes, especially from Asia and Latin America, are willing and more able than ever to travel both within and beyond their borders. According to the Un-World Tourism Organization (UNWTO), the percentage of international arrivals from emerging and developing countries increased steadily from 32% in 1990 to 47% in 2010. While in 1950, 15 leading tourist destinations accounted for 88% of international arrivals, in 2010 this had dropped to 55%.

In Spain, suffering from one of the highest unemployment in Europe, the sector is a crucial one with satisfying data: 12% of contribution to employment and 11% to Gross Domestic Product. Despite the current international financial crisis, the tourism sector has managed to maintain high levels of activity. Against a backdrop of weak demand and stiff competition, efficiency has come to the fore as a key issue, especially in consolidated markets, such as Spain, where expectations are that the sector will lead the way to economic recovery.

So the challenge mentioned above has special importance for mature and consolidated markets such as Spain and Europe in general. In the current scenario of strong pressure from the competition, performance becomes a key issue. This is borne out by the attention given recently to studies on the importance and impact of attributes that constitute the competitiveness of tourist destinations. In recent decades, the body of research Destination Competitiveness Theory has served as the basis for a wealth of studies, especially since some conceptual models like: (Crouch & Ritchie, 1994, 1995, 1999, 2005), (Ritchie & Crouch, 1993, 2000a, 2000b, 2003), (Mazanec, Wöber, & Zins, 2007), (Crouch, 2007, 2011), and (Benito-López, Solana-Ibáñez, & López-Pina, 2014). Emphasis has been placed on the fact that destination competitiveness is an area of growing interest with a clear need to direct research toward a better understanding of the attributes of competition. Following (Crouch, 2011, p. 43): "*A better understanding of the drivers of destination competitiveness has the potential to provide considerable help to the tourism industry*".

As a consequence, in the course of the last decade a growing number of initiatives and studies have supported the need to measure and monitor the competitiveness of tourist destinations. The Competitiveness Monitor of the World Travel & Tourism Council, from the World Economic Forum (WEF), is a good example of a leading stream of research on destination competitiveness. The sixth edition of the Travel & Tourism Competitiveness Report 2015, entitled: "Growth through Shocks" assesses 141 Economies Worldwide based on the extent to which they are putting in place the factors and policies to make it attractive to develop the Travel and Tourism sector. At the core of the Report is the Travel & Tourism Competitiveness Index (TTCI) which aim is to provide a comprehensive strategic tool for measuring the "*the set of factors and policies that enable the sustainable development of the Travel & Tourism sector, which in turn, contributes to the development and competitiveness of a country*". It reveals that the world leading country in terms of travel and tourism competitiveness is Spain, followed by France, Germany, Unites States and United Kingdom, with Thailand in 35th position. This translates as a gain of competitiveness if we apply the definition of (Ritchie & Crouch, 2003, p. 2): "*What makes a tourism destination truly competitive is its ability to increasingly attract visitors".*

This is not the unique initiative; there exist more related and similar ones as the ASEAN Travel & Tourism Competitiveness Report. By 2015, ASEAN (Association of Southeast Asian Nations) member countries aim to establish the ASEAN Community, a security, economic, and socio-cultural community of over 600 million people, which will account for nearly 5 percent of world GDP. ASEAN leaders have long recognized the vital role T&T can play in realizing their ambitions. Indeed, the potential for developing the T&T sector in the ASEAN region is enormous. The concern with competitiveness of a leading destination, like Spain, has sparked similar initiatives at the national level, e.g. the MONITUR report: Monitoring the Competitiveness of the Spanish Regions (also named Autonomous Communities - AC), which is presented as a tool that values and monitors the capacity of each AC to consolidate a differential and sustainable tourist standing. The last MONITUR report, published in July 2011, is the second and latest report available and is structured according to 7 pillars ordered in 30 spheres and it uses 79 indicators. The report provides partial rankings for the AC and an overall ranking, too.

It is outward then that managing destination competitiveness has become a major topic of interest, and new models and theories try to provide some clarity and rigor to a task characterized by its complexity. Indeed, as (Crouch, 2011, p. 28) states, "*at this stage in the development of destination competitiveness theory and knowledge, having now achieved a good basis on which to identify relevant attributes of destination competitiveness, there is particular value in turning the focus of research more toward assessing the relative importance of these attributes. The impact of a competitiveness attribute on the relative performance of a destination is a function of both the importance of the attribute as well as the degree to which destinations vary on the attribute*".

But, some questions remain unsettled. In the first place, Spain is the first country in the last WEF TTCI Index, but: Does it really mean Spanish Touristic model is sustainable? This paper contributes to this question with some final considerations about some new singularities of Tourism in Spain.

The type of indexes cited are self-constructed, of a descriptive nature, based on a group of factors or determinants that are supposed to be relevant to measure destination competitiveness. But, what are the reasons why these variables are supposed to be relevant? This paper contributes to this objective with its use of Data Envelopment Analysis (DEA), an internationally accepted mathematical technique for measuring efficiency; we exploit the advantage that technical efficiency in the utilization of resources is viewed as an approximation of destination competitiveness. Using this technique, we assess the position of each of the 17 Spanish regions, or AC, according to their levels of the variables chosen for the definition of the proxy measure. With DEA traditional analysis it is possible to ascertain the best performing destinations.

It is of great interest to offer new insights into the performance assessment of tourism destinations explaining the sources of efficiency variations. An important issue in productivity analysis is to detect how external environmental factors might influence the production process and the resulting efficiency of the units. Accordingly, as a final contribution, this work will analyze the hypothesis that the efficiency of Spanish regions is determined by a group of contextual variables that can explain the level of efficiency. This is done by applying the (Simar & Wilson, 2007) procedure to bootstrap the DEA scores with a truncated regression to estimate the effect of a selection of factors on robust DEA estimates.

The study is of interest since the significance or non significance of the factors considered can provide tourism policy makers with accurate information for future strategic decisions. The paper is organized as follows. In the next section we explore the area of destination competitiveness research. The third section is devoted to sample and variables chosen for the first-stage and second-stage DEA analysis. In section 4 we present the results of the DEA basic radial models and the analysis of determinants of efficiency obtained from applying the two-stage Simar and Wilson (2007) procedure to the Spanish regions for the period 2008-2011. The work ends with the conclusions.

2. Methodology

The strong competition remains the critical factor in Europe, where providers struggle to contain prices as tourists travel nearer to home and for shorter periods. In Spain, the businesses in the sector reacted with offers, discounts and deferred payment possibilities. In these conditions, tourists, especially those from abroad, have been driven to seek out and discounts and have opted in the main for hotel stays. It is foreseeable that international tourism will be a driving force of the economies of industrializing countries during the 21st century, especially in Asia. Countries like Spain need to develop strategies to make use of their comparative advantages to achieve competitive advantages, since, as (Gooroochurn & Sugiyarto, 2005, p. 25) say: "*the issue is especially important for countries that rely heavily on tourism*".

Many researchers have studied destination competitiveness, concepts, models and determinants. A good overview can be found in (Mazanec et al., 2007), (Tsai, Song, & Wong, 2009), (Crouch, 2011), (Assaf & Josiassen, 2011), (Benito-López et al., 2014) and (Assaf & Josiassen, 2015). The initial group of studies has sought to develop general models and theories of destination competitiveness. In the 1990s Crouch and Ritchie developed a comprehensive framework for tourism destination management: (Crouch & Ritchie, 1994, 1995, 1999, 2005), (Ritchie & Crouch, 1993, 2000a, 2000b, 2003), with five main groups of destination competitiveness factors and 36 destination competitiveness attributes. (Heath, 2003) developed a model based on (Ritchie & Crouch, 2000b); other models are those from (Dwyer & Kim, 2003), (Dwyer, Robert, Zelko, Deborah, & Chulwon, 2004), (Enright & Newton, 2004) and (Crouch, 2011).

A new group, made up of more recent publications, is devoted to investigate and test which determinants affect tourism performance. The procedure consists of developing a tourism performance index using the Data Envelopment Analysis (DEA) methodology, and then employing the (Simar & Wilson, 2007) bootstrap procedure to assess how this index varies with the different determinants of tourism performance. Many studies examine productivity using frontier models like DEA, and a good overview can be found in (Assaf & Agbola, 2011), (Fuentes, 2011), (Barros et al., 2011) and (Ribes, Rodríguez, & Jiménez, 2011). The two-stage procedure employed supposed a novelty and only a few and very recent studies on the tourist sector of this type can be found.

As said before, indexes as WEF TTCI, or Spanish CM, aims to measure the factors and policies that make it attractive to develop the T&T sector in different countries. The TTCI is based on 3 categories, each of which comprises a total of 14 pillars and within each pillar we find a number of final 75 variables. The scores obtained by each country are compared with those of the previous report, and the final report of 2015 contains detailed information on each and every one of the 141 countries covered by the study. The WEF report shows the correlation between the 2015 TTCI scores and log form tourist arrivals. Following the report, the regression supports that the TTCI captures factors that are important for developing the T&T industry. But, the survey data comprise the responses to the World Economic Forum's Executive "Opinion" Survey and range from 1 to 7. The standard formula for converting each hard data variable to the 1-to-7 scale is really simple in its nature:

$$6 \cdot \left[\frac{\text{country score} - \text{sample min}}{\text{sample max} - \text{sample min}}\right] + 1 \qquad (1)$$

The sample minimum and sample maximum are the lowest and highest scores of the overall sample, respectively. For those data variables for which a higher value indicates a worse outcome (e.g., road traffic accidents, fuel price levels), TTCI rely on a normalization formula that reverses it, so that 1 and 7 still correspond to the worst and best, respectively:

$$-6 \cdot \left[\frac{\text{country score}-\text{sample min}}{\text{sample max}-\text{sample min}}\right] + 7 \quad (2)$$

Additionally "*In some instances, adjustments are made to account for extreme outliers in the data*", but there is no explanation about this adjustment process. Then, each of the 14 pillars value is calculated as an unweighted average of the individual component variables. For each of the 3 main categories, the sub-indexes A, B and C, a value is calculated as unweighted averages of the included pillars; finally, the overall TTCI is obtained as the unweighted average of the 3 sub-indexes.

Given this personal and subjective setting, we can state these TCCI type indexes are merely descriptive and the methodology employed is elementary and perhaps unacceptable. As noted by (Assaf & Josiassen, 2011, p. 7): "*While the TTCI is probably the best known instrument used to rank nations according to their travel and tourism competitiveness, it is important to note that it is not a performance index*" … "*it is not possible from this index to determine which inputs can be translated into industry performance most efficiently*". It is true that tourism attraction can increase the sources of revenue and improve a destination's performance, but, we need to know if the attractors are statistically significant or not. The significance or not of the factors under consideration can provide tourism policymakers with accurate information to take forward to future strategic decisions. Naturally, it ́s good to rely on experts, but Science is for nothing here? What is the relative importance of these attributes? The TTCI calculate unweighted means and it implies factors are equally important. Put in another way, in Thailand, for example, the factor "hotel rooms" has the same importance than "Primary education enrollment": in any case, some doubts should arise. Besides, the impact of a competitiveness attribute on the relative performance of a destination is a function of both the importance of the attribute as well as the degree to which destinations vary on the attribute. The same problem can be addressed in Spain, where the MONITUR Report, in (EXCELTUR, 2011), is of relevance and provides a comprehensive list of determinants that drive tourism performance and the global index value of each of the Spanish ACs.

For years, Tourism studies have been underestimated and considered as a Social Science, with a clear lack of more sophisticated research methodologies and applied studies. This is no longer true, if ever, and we today we can confirm without any doubt tourism is a "scientific" social discipline where use of parametric and semiparametric techniques are a forthcoming and certain area for future. Consequently, and as an example, in this paper we use the (Simar & Wilson, 2007) bootstrap procedure to analyze to what extent the competitiveness of Spanish tourism regions is determined by a group of contextual variables, their accommodation possibilities, natural resources and historical monuments.

2.1 Data Envelopment Analysis

Data Envelopment Analysis (DEA) is one of the most popular methods to estimate efficiency. It aims to define a representation of all the efficient Decision Making Units, DMUs, the frontier, or envelopment surface for all sample observations. An efficiency score is calculated for each DMU, such that those ones that do not lie on the frontier are considered as inefficient. Historically, (Farrell, 1957) is the pioneering first empirical work to estimate efficiency scores and this has been popularised by (Charnes, Cooper, & Rhodes, 1978) and (Banker, Charnes, & Cooper, 1984) using linear programming techniques, by the DEA pathway proposed in these works that rely on the convexity assumption for the production set and various returns-to-scale assumptions. Estimates without imposing convexity on the production set came later in the works of (Afriat, 1972) and (Deprins, Simar, & Tulkens, 1984), the free disposal hull (FDH) estimator.

The non parametric approach does not need to specify a production function, avoiding the imposition of restrictive hypotheses on the data generating process. It is supposed a group of n DMUs, DMU_j, j=1,2,…,n, for which we consider a common set of "m" inputs, $\{x_{ij}\}_{i=1}^{i=m}$, and "s" outputs, $\{y_{rj}\}_{j=1}^{j=s}$. The production possibility set, Ψ, the set of all feasible input and output vectors, is defined as follows:

$$\Psi = \{(x, y) \in R_+^m \; x \; R_-^s : x \; can \; produce \; y\} \quad (3)$$

The DEA index can be calculated following different orientations. Given the singularities of units being analysed and as in preceding papers such as (Demchuk & Zelenyuk, 2009), we will assume that the Spanish foundations aim to minimize the input given the outputs, i.e., we will assume the Spanish regions aim to maximize the output given the inputs, i.e., we will assume output orientation. The so-called Debreu-Farrell output-oriented technical efficiency measure is defined as:

$$\delta(x, y) \equiv max_\theta\{\theta : (x, \theta y) \in \Psi\} \quad (4)$$

For δ(x,y)=1, the DMU is efficient and it is not efficient when δ(x,y)>1. Following (Färe & Lovell, 1978), (Färe & Primont, 1995), (Charnes, Cooper, Lewin, & Seiford, 1994) or (Thanassoulis, 2001), we assume that technology characterization follows regularity conditions, but that the true technology is unknown, and we therefore have to estimate the inefficiency measures based on the observed data. Specifically, the estimate of Ψ for the assumption of constant returns to scale (CRS) is defined as:

$$\widehat{\Psi} = \{(x,y) \in R_{+}^{m} \, x \, R_{-}^{s}: x_{ij} \geq \sum_j \lambda_j x_{ij}, y_{rj} \leq \sum_j \lambda_j y_{rj}, \lambda_j \geq 0, j = 1, \dots, n; i = 1, \dots, m; r = 1, \dots, s\} \quad (5)$$

CRS measures the overall efficiency for each unit (pure technical efficiency and scale efficiency). The variable returns to scale, VRS, efficiency model, by (Banker et al., 1984), is estimated by restricting $\Sigma\lambda_j=1$; it provides measures of pure technical efficiency. Scale efficiency score, by (Färe, Grosskopf, & Lovell, 1985), is obtained by dividing the CRS score by the VRS score. The λ_j are the intensity variables over which optimization (4) is made, and $\widehat{\Psi}$ is the smallest convex free disposal cone in (x,y) space. Replacing Ψ with $\widehat{\Psi}$, the estimates of the efficiency scores, $\hat{\delta}(x,y)$ are consistent estimates of the corresponding true efficiency scores, $\delta(x,y)$.

DEA models such as those developed by (Charnes et al., 1978) and (Banker et al., 1984), were labelled as deterministic and the methodology has been widely applied in the assessment of the efficiency of productive units. Introductory textbooks and works that present a more comprehensive picture of the topic and a collection of applications, can be found in (Seiford, 1996) , (Thanassoulis, 2001), (Tavares, 2002), (Emrouznejad, Parker, & Tavares, 2008), (Cook & Seiford, 2009), (Cooper, Seiford, & Zhu, 2011), (Zhu, 2014) or (Simar & Wilson, 2015).

This non-parametric body of research suffers from the "curse of dimensionality" which means that the nonparametric estimators rate of convergence decreases when the dimension of the attainable set increases: following (Simar & Zelenyuk, 2010), the rate of the FDH estimator is $n^{1/p+q}$, whereas for the DEA with the additional assumption of convexity, the achieved rate is $n^{2/p+q+1}$. But currently, statistical properties of DEA estimators are now available using asymptotic results or by using bootstrap. The work of (Simar & Wilson, 1998) was the first to introduce the bootstrap procedure, invented by (Efron, 1979), to perform traditional statistical inference in DEA: the DEA efficiency estimates are prone to uncertainty due to sampling variation. The bootstrap procedure gives an estimated bias and the variance, which in turn provide confidence intervals and it was later made more flexible in (Simar & Wilson, 2000) and the algorithm was computationally implemented in statistical software FEAR by (Wilson, 2008).

In (Simar & Wilson, 2007), authors extended their approach to account for the impact of environmental variables on efficiency. It is of interest to identify the peculiarities of the production process or the economic conditions that may be responsible for the inefficiencies detected. The choice of exogenous variables is related to the economic area in which the units under consideration operate and it should be based on the characteristics of the specific production process in question. To meet this aim, what is known as two-stage estimation procedure has been developed in the literature. In the first stage, technical efficiency is estimated by DEA and the resulting efficiency estimates are regressed on some environmental variables in a second stage. This two-stage estimation procedure is not the only way to account for the impact of environmental variables on efficiency and the main proposals in literature can be summarised as of three types: one-stage; the above-mentioned two-stage; and the probability approach. A review can be found in (Benito-López, Moreno-Enguix, & Solana-Ibáñez, 2011).

The causes of the inefficiency are analysed by considering a group of external factors so as to better characterize the operational environment. The (Simar & Wilson, 2007) procedure supposed a turning point in the treatment of exogenous factors, and for its application important considerations must be considered from (Simar & Wilson, 2011, 2015), where a key updated discussion of the method is considered.

According to the two-stage (Simar & Wilson, 2007) procedure, the efficiency coefficients for each DMU are obtained in the first stage in the assessment that exclusively considers discretional variables. The model takes the form:

$$\delta_i = \psi(z_i, \beta) + \xi_i \quad (6)$$

where δ_i is assumed to be a function, $\psi(z_i, \beta)$, of environmental covariates, z_i, which is expected to influence the efficiency of DMU_i, and β denotes a vector of parameters to be estimated together with an independently distributed random variable, with ξ_i, representing the part of inefficiency not explained by z_i.

As the δ_i are not observed, (Simar & Wilson, 2007) propose two ways of tackling the situation. In the first, DEA estimates from the first stage, $\hat{\delta}_i$, replace the unobserved δ_i in (6), and, as explained by (Park, Simar, & Zelenyuk, 2008) or (Daraio, Simar, & Wilson, 2010), $\psi(z_i,\beta)= z_i \beta$. Since the DEA estimates are consistent under the assumptions of the (Simar & Wilson, 2007) model, Maximum Likelihood estimation of the following truncated regression yields consistent estimates of β,

$$\hat{\delta}_i = \psi(z_i, \beta) + \xi_i \quad (7)$$

However, as it is stated by (Simar & Wilson, 2011, 2015), while the $\hat{\delta}_i$ consistently estimate the δ_i, the DEA estimators converge slowly and are biased. The bootstrap procedure given in Algorithm-1 in (Simar & Wilson, 2007) is the only method that has been shown to be valid for making inference about β when (7) is estimated by Maximum Likelihood. In the second, bias-corrected estimator, $\hat{\hat{\delta}}_i$, replaces the unobserved δ_i in (6), with $\psi(z_i, \beta)=z_i\,\beta$, and yields another truncated regression model in which Maximum Likelihood estimation produces consistent estimates of β. In this alternative procedure, the bootstrap given in (Simar & Wilson, 2007) Algorithm-2, is the only known method to make valid inference about β since conventional methods fail to give valid inference.

(Simar & Wilson, 2007) demonstrate that when the number of units is low, the use of algorithm-2 worsens the estimation error compared to algorithm-1. Consequently it is convenient in our application to apply algorithm-1: details of Algorithm can be obtained from (Simar & Wilson, 2007, 2011, 2015) and also in applied works such as (Benito-López et al., 2011) and (Benito-López, Solana-Ibáñez, & Moreno-Enguix, 2012). To this purpose, FEAR 1.15 includes dea, boot.sw98, rnorm.trunc and t.reg among its routines.

As (Simar & Wilson, 2011, p. 210) indicate, within the assumptions of the model, Tobit regression constitutes a misspecification. The simulation results presented by authors confirm that Tobit estimation in the second stage yields biased and inconsistent estimates. (Simar & Wilson, 2011, p. 209) and (Simar & Wilson, 2015, p. 97): "*As far as we are aware, no statistical model in which second-stage Tobit regression of DEA efficiency estimates on some environmental variables would produce consistent estimates has been presented in the literature*".

3. Inputs, Outputs and Exogenous Variables

The Spanish-European tourism industry has recently experienced some of the worst times in its history. Activity fell in 2008 and, particularly, 2009 by over 10%, as the destructive effects of the financial crisis bit into one of the most dynamic sectors of Spain's national economy. The year 2010 showed some signs of recovery in a period marked by debility and difficulties in accessing credit, not to mention some specific harmful events: the volcanic ash cloud in April, strikes in the summer and work-to-rule by air traffic controllers in December and Christmas blizzards across Northern Europe.

In 2010, recovery in Spain followed the world trend, but this recovery was much faster in emerging countries, where international arrivals rose 8% compared to just 5% in developed countries. Europe, the most mature destination along with America, showed lower growth of 3%, well below the world average of 6.6%. According to real international tourism revenues, all regions except Europe showed positive growth, whereas Europe stood at –0.4%, which was well below the world average of 4.7%.

Without doubt, strong competition has been and remains the critical factor for European destination, where providers struggle to contain prices. It is expected that international tourism will become a driving force in the economies of industrializing countries during the course of the 21st century, especially in Asia. Therefore, European countries like Spain need to develop strategies to make use of their comparative advantages to achieve competitive advantages, since "the issue is especially important for countries that rely heavily on tourism.

In 2012, tourism Spanish revenues generated a surplus of 31,610 million euros, which was sufficient to cover the deficit of the trade balance around 123%, key figures (in the last 15 years) to reduce the problems. Spain's tourism brand has developed over decades; the country is associated with an image linked to holidays, the light and heat of the sun and hospitality, attributes that link to the concept of happiness. Besides friendly and hospitable nature of Spanish people, we also have unusual natural conditions: 8,000 km of coastline and 1891 hours of sunshine a year, quality and variety of resources, tourism offerings and infrastructure network.

Taking in consideration the information published by Spanish Institute of Tourism Studies (ITS), extraordinarily, at the end of 2014, the cumulative number of tourists had reached the record figure of 65 million, with a 5.6% of year to year variation rate and a 7.1% of cumulative year to year. Table 1 shows tourism entries by main Spanish region destination; as noted, 6 AC accounts for round 90%. At the same time, table 2 represent main data for all Spain main markets: they improve their figures relative to preceding year, especially France, United Kingdom, Germany and Italy, with 2.8 million of additional tourists.

Table 1. Tourism entries broken down by main destination Spanish regions. December 2014

Spanish Regions	Total	Vertical Percentage	Year-To-Year Variation Rate	Cumulative Since January	Cumulative Year-To-Year Variation Rate
Canary	1.018.121	31.20%	-2.2	11,475,211	8.0
Catalonia	863.826	26.47%	13.0	16,814,199	7.6
Andalusia	350.502	10.74%	3.8	8,501,991	7.8
Madrid	308.662	9.46%	-1.8	4,546,559	7.5
Valencian	275.016	8.43%	4.9	6,233,881	4.4
Balearic Islands	95.441	2.92%	23.0	11,367,224	2.8
Rest Of The AA.CC.	352.130	10.79%	19.6	6,056,210	14.7
Total	3.263.698	100%	5.6	64,995,275	7.1

Table 2. Tourism entries broken down by country of residence. December 2014

Country	Total	Vertical Percentage	Year-To-Year Variation Rate	Cumulative Since January	Cumulative Year-To-Year Variation Rate
United Kingdom	619.112	18.97%	-0.8	15,006,744	4.7
France	564.289	17.29%	5.9	10,615,746	11.3
Germany	473.927	14.52%	0.2	10,422,055	5.7
North Countries	353.049	10.82%	-6.5	5,044,539	3.5
Italy	197.845	6.06%	14.3	3,697,702	14.6
Rest Of The World	186.055	5.70%	22.2	2,776,015	18.8
Rest Of Europe	178.444	5.47%	23.2	3,129,041	6.7
Portugal	130.475	4.00%	44.2	1,876,524	11.7
Netherlands	126.352	3.87%	-2.2	2,767,130	5.7
Belgium	118.099	3.62%	28.4	2,180,457	16.4
Rest Of America	95.505	2.93%	-3.5	1,916,612	2.5
Switzerland	80.350	2.46%	38.9	1,632,011	9.7
Ireland	49.640	1.52%	7.2	1,291,435	1.7
Total	3.263.698	100%	5.6	64,995,275	7.1

Our initial sample comprises data for the 17 Spanish ACs between 2008 and 2011. We will consider that the goal of the regions is to achieve maximum competitiveness or attractiveness. The discretionary variables employed for the first stage DEA analysis, inputs and outputs, were chosen with the aim of obtaining an attractiveness or competitiveness proxy efficiency score of each region. The advantage of DEA technique here is that by (Simar and Wilson 1998, 2000) bootstrapping it is possible to correct serious problems associated to the deterministic nature of radial type measures.

Accommodation capacity (ACCOM) is the total number of beds available (hotels, hotel-apartments, motels, hostels, lodgings, campsites, tourist apartments, and rural tourism accommodation); number of bed-nights (NBENI) is the total number of nights a traveler stays at on establishment. Tourist arrivals (COMIN) are the total number of people staying at least one night at an establishment. The data are from Spanish National Institute of Statistics (NIS) and Spanish Institute of Tourist Studies (ITS), and table 3 provides some descriptive statistics of the inputs and the output employed in the analyses for the period 2008-2011.

Table 3. Descriptive statistics discretionary variables 2008-2011

Variable	Min	Max	Mean	Std. Dev.
ACCOM	664,482.10	18,219,147.28	5,798,244.62	5,435,620.67
NBENI	1,344,730.49	81,199,137.87	21,614,008.02	25,446,590.18
COMIN	13,303.56	449,509.21	140,709.92	140,553.38

As a mean for the period, 5.8 million tourist arrivals supposed some 21.6 million bed-nights. The high standard deviation indicates that the data are spread out over a large range of values.

For the second stage of (Simar & Wilson, 2007) procedure we will employ a group of environmental factors. The variables selected at this stage include factor recognized by the Spanish AC MONITUR Report as some of the tourist attractions of highest impact in Spain. For the application we select those with strongest theorical influence on the competitiveness of Spanish ACs to be confirmed by the results, given that although an attribute may be considered important, it will not be a determinant of competitiveness if there is little difference among destinations on the attribute. Given their condition of attractors we expect a positive sign for the coefficients to be estimated below.

The environmental factors to be considered are: COAST, a dummy variable with null value if the region is coastal, and

0 if not; CULT, the number of cultural properties; ART is the number of museums and collections. CONF measures the importance of each region in Conference and Conventions Tourism on the basis of the percentage of attendance at meetings; NATU measure the importance of nature tourism, in fact, Spain is the 3erd country in the world with the most World Heritage Sites (WHS); GOLF measures the number of clubs federated with the region; there hast been a growth in the number of tourists travelling to Spain to sample its gastronomy. Accordingly, FOOD variable measures the number of restaurants per region; Finally, SHOP is a proxy for shopping tourism. It has been approached from the number of retailers per region.

COAST data are provided by the "*Subdirección General de Protección del Patrimonio Histórico del Ministerio de Educación, Cultura y Deporte*" (www.mcu.es/culturabase); ART data are taken from the "*Estadística de Museos y Colecciones Museográficas, Ministerio de Cultura*" (www.mcu.es/culturabase). This variable is included in (Barros et al., 2011) and the coefficient was positive and significant. CONF data are obtained from the Spain Convention Bureau (www.scb.es). NATU data are taken from the "*Spanish Ministry for Agriculture, Food and environment*" (www.magrama.es) and the "*Europarc Federation*" (www.redeuroparc.org). (Barros et al., 2011) obtain a positive estimated coefficient. GOLF variable data are taken from the "*Spanish Ministry for Education, Culture and Sport*" (http://www.educacion.gob.es). FOOD data were obtained directly from the DIRCE directory of the National Institute for Statistics (www.ine.es). SHOP data are taken from the "*Anuario Económico de España de La Caixa*" (www.lacaixa.comunicacions.com).

4. Results

4.1 DEA first-stage radial scores

The first stage in the assessment, i.e., considering only the discretional input and output variables (ACCOM, NBENI and COMIN), provides the efficiency coefficients for each Spanish Region. Table 4 shows average efficiency scores for the DEA ratio output oriented models with the three assumptions: CRS (constant returns-to-scale), VRS (variable returns-to scale) and NIRS (non-increasing returns to scale). Calculations were using the FEAR1.15 software library (9 November 2010), developed by (Wilson, 2008) under the statistical package R, Hence, efficiency is measured in terms of Shephard's input distance function, which is the reciprocals of the (Farrell, 1957) efficiency measures. The DEA score is between 0 and 1: regions with DEA scores equal to 1 are efficient. The CRS index, also named CCR, measures the overall efficiency for each region and is a mixture of pure technical efficiency (VRS index) and scale efficiency. The ratio overall efficiency to pure technical efficiency runs a scale efficiency measurement, while NIRS scores help to measure the returns to scale. Pure technical inefficiency corresponds to inefficiency due to management and, consequently, this named BCC scores can be interpreted as managerial skills. Another part of the inefficiency is the result of the unit's operating on an unfavorable scale, i.e. scale inefficiency. According to CRS supposition, reference sets may be made up of efficient DMUs of any size.

Table 4. Average efficiency DEA scores for Spanish ACs 2008–2011

Region	DEA output CRS	DEA output VRS	DEA output NIRS	Scale Efficiency	RTS
Andalucía	0.765	0.789	0.789	0.973	DRS
Aragón	0.496	0.765	0.765	0.648	DRS
Asturias	0.518	0.625	0.625	0.831	DRS
Baleares	0.664	0.803	0.803	0.810	DRS
Canarias	0.873	0.971	0.971	0.889	DRS
Cantabria	0.513	0.570	0.570	0.904	DRS
Castilla_León	0.893	1.000	1.000	0.893	DRS
Castilla_Mancha	0.306	0.430	0.430	0.712	DRS
Cataluña	0.743	0.911	0.911	0.816	DRS
Com_Valenciana	0.245	0.317	0.317	0.765	DRS
Extremadura	0.576	0.773	0.576	0.776	IRS
Galicia	0.598	0.973	0.973	0.615	DRS
Madrid	0.311	0.559	0.327	0.635	IRS
Murcia	1.000	1.000	1.000	1.000	CRS
Navarra	0.447	0.624	0.465	0.731	IRS
País Vasco	0.559	0.612	0.608	0.915	IRS

Rioja	0.078	0.149	0.083	0.747	IRS
Min	0.078	0.149	0.083	0.615	
Max	1.000	1.000	1.000	1.000	
Mean	0.564	0.698	0.660	0.804	
Std. Dev.	0.559	0.765	0.625	0.810	

When all sources of inefficiency are considered, under CCR model or CRS assumption, the average efficiency score is 0.564. It means, on average and given the inputs, Spanish regions could improve their output by 43.6%. It is more functional to establish comparisons between units of similar behavior to the one evaluated and this is accomplished by the BCC model, i.e. under VRS assumption. Then, the average efficiency score under VRS is higher, 0.698.

Following (Färe & Grosskopf, 1985), the scale efficiency score is obtained by dividing the CRS score by the VRS, and a region is scale efficient when its size of operation is optimal. Returns to scale deals with the way the production process can be scaled up and down for each region. Those with DRS are large in dimension, and a decrease in input would imply a lower than proportionate decrease in output. It can be interpreted as a satiation in arrivals given the characteristics of the region.

Clearly, not all the regions analyzed have the same efficiency and the radial models indicate Murcia region as being efficient. Though, the observations at the DEA frontier are efficient but only apparently: they are low-biased. Using bootstrap techniques, like in (Simar & Wilson, 2000), it is possible to correct the bias and obtain confidence intervals for the estimations. In (Wilson, 2008) author´s algorithm was computationally implemented in statistical software FEAR. Therefore, in order to consider the stochastic nature of the estimation problem we can use this bootstrap procedure to correct for bias in the estimates of the VRS efficiency scores. Table 5 shows the average efficiency estimates information of the bootstrapped DEA results for the period considered.

Table 5. Average VRS unbiased efficiency scores: 2008–2011

Year	$\hat{\delta}$	$\hat{\hat{\delta}}$	$\widehat{\text{bias}}_B(\hat{\delta})$	$\hat{\sigma}^2$	L.L.	U.L.
2008	0.740	0.580	0.242	0.056	0.526	0.732
2009	0.662	0.536	0.367	1.854	0.464	0.649
2010	0.668	0.584	0.452	2.731	0.467	0.654
2011	0.725	0.626	0.381	1.903	0.495	0.705
2008-2011	0.699	0.581	0.360	1.636	0.488	0.685

The columns $\hat{\delta}$ and $\hat{\hat{\delta}}$ provides the VRS original and bias-corrected average distance function estimates respectively. The statistical value has been added to the final column, $r_i = 1/3 \cdot \widehat{bias_B}(\hat{\delta})/\hat{\sigma}^2$. Its values may be used to assess whether the bias correction might increase the mean squared error. (Simar & Wilson, 2000, p. 790) advise that bias-correction should only be used when the ratio is well above unity. The column $r_i = \widehat{bias_B}(\hat{\delta})$, gives the bias estimates obtained with the bootstrap, for which it has been used B=2,000 bootstrap replications. The last three columns show the data for the statistical inference, i.e. the estimated variance and the lower limits (L.L.) and upper limits (U.L.) of the confidence intervals at the 95% level. The efficiency scores obtained from the bootstrap model lie within the lower and upper bounds; it is more robust that the traditional model in estimating the pure technical efficiency of each region. The period 2008-2010 as a whole has an average value of 0,699, suggesting that Spanish regions are performing at 30% below their possibilities.

If we take data from MONITUR 2011 ranking and that obtained from the 2011 VRS unbiased efficiency scores, differences are evident. Table 6 contains the two classifications:

Table 6. MONITUR Ranking and VRS unbiased scores. Spanish ACs. 2011

Spanish AC	MONITUR Ranking	VRS unbiased scores ranking
Madrid	1	2
País Vasco	2	12
Cataluña	3	7
Andalucía	4	10
Canarias	5	1
Baleares	6	9
Com_Valenciana	7	16
Galicia	8	3
Navarra	9	6
Rioja	10	17
Castilla_Mancha	11	15
Castilla_León	12	4
Asturias	13	11
Murcia	14	5
Cantabria	15	13
Aragón	16	8
Extremadura	17	14

4.2 Two-stage DEA. Analysis of Determinants

In the two-stage (Simar & Wilson, 2007) algorith-1 procedure, first stage estimated scores under the BCC model (VRS assumption) are regressed in a truncated normal regression model on the group of environmental factors. Then we construct bootstrap 95% confidence intervals for each parameter estimate[1]. Next we write the model to estimate and table 7 shows the results:

$$\hat{\delta}_{it} = \alpha_1 Coast_{it} + \alpha_2 Cult_{it} + \alpha_3 Art_{it} + \alpha_4 Conf_{it} + \alpha_5 Natu_{it} + \alpha_6 Golf_{it} + \alpha_7 Food_{it} + \alpha_8 Shop_{it} + \xi_{it} \quad (8)$$

Table 7. Two-Stage DEA. Efficiency Determinants. Spanish ACs. 2008-2011

Determinant	Estimated Coefficient	95% Bootstrap Confidence Intervals	
COAST	0,025142563 (s)	0,02059535	0,02968978
CULT	0,001254785 (s)	-0,00329243	0,00580200
ART	0,002154478 (s)	-0,002392735	0,006701692
CONF	0,021358965 (ns)	0,016811751	0,025906179
NATU	0,009584523 (s)	0,005037309	0,014131737
GOLF	0,000120455 (ns)	-0,004426759	0,004667669
FOOD	0,241298566 (s)	0,236751353	0,24584578
SHOP	0,000025488 (s)	-0,004521726	0,004572702

(s) Indicate significance at the 5% level.
(n.s.) Indicate non significance at the 5% level.

5. Conclusions

A tourism region can be considered as a Decision Making Unit that employs certain inputs to obtain certain outputs. This paper offers a new focus for analyzing competitiveness determinants in tourism regions. Our analysis rests on an appropriate choice of exogenous factors that, given the peculiar characteristics of the sector, best describe the situation of each area, and it is complemented by a the choice of the DEA methodology, specifically, the two-stage double bootstrap procedure.

At this stage in the development of destination competitiveness theory, there is a good basis on which to identify relevant attributes of destination competitiveness, and a particular value in turning the focus of research more toward assessing the relative importance of these attributes. While the TTCI is the best known instrument used to rank nations according to their T&T competitiveness, it is important to note that it is not a performance index: it is not possible from

[1] For details see (Zelenyuk & Zheka, 2006) or appendix 1 in (Latruffe, Davidova, & Balcombe, 2008).

it to conclude which inputs can be translated into industry performance most efficiently. The same problem can be addressed in Spain with the MONITUR report.

It is true that Tourism Attraction can increase the sources of revenue and subsequently improve a destination's performance, but, we need to know if the attractors are statistically significant or not. To this end, we have addressed one promising path.

The significance or not of the factors under consideration can provide tourism policymakers with accurate information to take forward to future strategic decisions. It is good to rely on experts, but mathematical programing techniques are not for nothing. The results from table 7, the estimated coefficients $\widehat{\alpha}_{it}$ in (8), are of the correct sign and statistically significant at a 5% level, except in the case of CONF and GOLF, which give a positive coefficient although not significant. The coefficients of COAST, CULT, ART, NATU, FOOD and SHOP are all positive and statistically significant in influencing the competitiveness of Spanish regions and can be considered as tourist attractors. The results are consistent with previous and analogous studies developed in (Barros et al., 2011) and similar results are derived in (Benito-López et al., 2014).

The interest of this methodology is related to one of the deepest changes in the current tourist scenario: the new types of consumer behavior, where the presence of a cluster of services is essential for satisfaction and the development of destinations will be enhanced in regions representing a cluster attraction.

The main results were probably as expected, but, in contrast with monitoring reports based on expert opinions and in descriptive methods, now, we can investigate which attractors are statistically significant for the competitiveness of regions belonging to a country or area. Policy makers should act in consequence with this result. As an example, the Spanish Tourism Plan for 2015 aim to promote the Shopping Tourism. Spanish Policy Makers know this variable is not working well in the country, but they know it thanks to intuition and perhaps for relative international position of Spain by reports as 2014 UNWTO Global Report on Shopping Tourism. The key question we want to address is that Tourism discipline can offer the necessary tools for these strategic decisions. A new paradigm must be open in order to create a new link between our discipline and public and private sector.

Europe is the world's number 1 tourist destination, with the highest density and diversity of tourist attractions. The tourist industry has become a key sector for the European economy. The new legal framework in Europe is an opportunity to carry out actions to reduce administrative burdens, benefiting all countries, and four priorities for action have been identified from the year 2010: to stimulate competitiveness in the European tourism sector; to promote development of sustainable, responsible, high-quality tourism; to consolidate Europe's images as a collection of sustainable, high-quality destinations, and to maximize the potential of EU financial policies for developing tourism.

The EU is clearly involved and worried about competitiveness and the DEA technique offers new insights to be considered. But, one additional question remains: the sustainability of the touristic model. In the case of Spain, with its new first position in WEF competitiveness 2015 ranking, we wonder about compatibility between competitiveness and sustainability.

As the leading international organization in the field of tourism, UNWTO promotes tourism as a driver of economic growth, inclusive development and environmental sustainability, and offers leadership and support to the sector in advancing knowledge and tourism policies worldwide. UNWTO encourages the implementation of the Global Code of Ethics for Tourism, to maximize tourism's socio-economic contribution while minimizing its possible negative impacts, and is committed to promoting tourism as an instrument in achieving the United Nations Millennium Development Goals (MDGs), geared towards reducing poverty and fostering sustainable development. Indeed, UNWTO works in six main areas: competitiveness, sustainability, poverty Reduction, capacity building, partnerships and mainstreaming, and sustainable and universally accessible tourism.

Pressure is strong since Europa needs a future growth from non-neighbouring markets; rates should be greater from world regions outside Europe and, of particular importance should be the BRIC economies. The Russian market is about the same size as the US market and is the key BRIC market for Europe. The Chinese market, about a quarter of the size of the Russian, is the second largest BRIC market for Europe. In third position: Brazil and then India. Of course, BRIC countries are only part of market development strategy.

More pressure derives from the following European Commission declaration and the shortage of financial funds, especially in Spain: "*if Europe is to remain the world's number one tourist destination, tourism should not be taken for granted. Political efforts should be enhanced and supported with appropriate investment in priority areas to ensure future competitive growth and sustainable tourism development*".

In this context marked by recession in our main markets and in our own economy, we find that Spain has received more tourists than in previous years, and that these tourists have spent more. At the same time, our tourism mature model has moderate growth rates, we move in an environment of increasingly strong competition and change, and following

UNWTO recommendations, it is essential to move towards responsible tourism in all aspects; economic, social and environmental, promoting sustainable growth.

Consequently, a question for future research is to analyse this demanding and problematic link between competitiveness and sustainability, and in Spain, today, we can no trace a touching path between them. Probably, part of Spanish gains in competitiveness has come through prices as well as some new phenomena far from sustainability, with special mention to *pubcrawling*, or the act of one or more people drinking in multiple pubs or bars in a single night. The final question is therefore: Competitiveness and Leadership at any price?

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